

Ravine Bluffs Development Bridge
(Sylvan Road Bridge)
(Frank Lloyd Wright Bridge)
Spanning the ravine at Sylvan Road
Glencoe
Cook County
Illinois

HAER No. IL-14

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Rocky Mountain System Support Office
National Park Service
P.O. Box 25287
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HISTORIC AMERICAN ENGINEERING RECORD

RAVINE BLUFFS DEVELOPMENT BRIDGE

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I. INTRODUCTION

Location: Sylvan Road, spanning a ravine, 182' west of Franklin Road and approximately 199' east of Meadow Road, Glencoe, Cook County, Illinois.

Present Owner: Bridge was demolished in 1984. Until that time the Village of Glencoe, Cook County, Illinois, owned the bridge.

Present Use: The Village of Glencoe built a new bridge, which replicated the appearance of the original bridge in 1984-85. The new bridge is used for vehicular and pedestrian traffic, as the original bridge had been.

Significance: The Ravine Bluffs Development Bridge (also known as the Sylvan Road Bridge), constructed as the entrance to a housing subdivision developed by his friend and attorney Sherman Booth, was one of only two freestanding built bridges designed by Frank Lloyd Wright. Six houses including one for Booth were built in the development, along with three entrance features (sculptures with street lamps and planters) and the Ravine Bluffs Bridge. The entrance features and the bridge were executed in reinforced concrete. Although the bridge was a unique example of Wright's work, many of its elements exemplify the Prairie School style he originated. These include strong horizontal lines, rectilinear geometric massing, planting urns and built-in lighting and seating. The cantilevered sidewalk and innovative use of cast-in-place concrete are other Wright trademarks.

Project Information: This HAER documentation was prepared by Susan Solway and Susan Benjamin, architectural historians, for the Village of Glencoe, Illinois. It was completed under the auspices of the firm of Hampton Lenzini and Renwick, Inc., Civil Engineers and Land Surveyors, Elgin, Illinois. The authors gratefully acknowledge the research assistance of Howard Wayne Siegel in the preparation of this document. The project was completed August 12, 1996.

II. HISTORICAL INFORMATION

Date, Materials, and Construction Method: The Ravine Bluffs Bridge was erected in 1915. On March 30, 1915, Ordinance #720, providing for the construction of a reinforced concrete bridge in the Ravine Bluffs Subdivision, was accepted and approved by the Village of Glencoe's Board of Trustees¹. The ordinance also provided for the grading, draining, and macadamizing of Sylvan Road and Meadow Road. Exact specifications for materials, including the composition of the concrete, and methods of construction were indicated in the ordinance, and the bridge was to be built as follows:

A reinforced concrete bridge shall be constructed across the ravine in Sylvan Road . . .

The concrete for the footings and piers shall be composed of one part Portland Cement, three parts sand and six parts crushed stone or gravel. All other parts of the bridge shall be built of concrete composed of one part Portland Cement, two parts sand and four parts crushed stone or gravel. Said concrete shall be thoroughly mixed and sufficient water added to make what is called a "wet mix", but not wet enough to cause the aggregate to separate. The concrete shall be placed in smooth, well braced, water tight forms . . ., and said concrete shall be thoroughly spaded next to the face of the forms so that the surface of the concrete after removing said forms will be smooth and true to dimensions. All reinforcement of said concrete shall be . . . securely held in place to insure being in exact position when the concrete is set.

All reinforcing shall be cold twisted square steel bars, except the wire mesh which shall be of soft steel.

Drawings for earlier designs for a concrete bridge to be built at Ravine Bluffs were done in 1911 and 1912. The first scheme Wright conceived was for a long bridge that spanned a ravine and extended directly up to the Booth house. This early design for Booth's residence was very elaborate, and the bridge roadway extended under a bridge that connected two sections of the house. Wright also drew designs that were similar in general form to the bridge that was built. One had a mezzanine and arched opening; the second did not have an arch spanning the ravine. Neither contained seating or round urns. Copies of several of Wright's drawings for these early designs were provided to the Village of Glencoe by The Frank Lloyd Wright Foundation in 1982. A drawing of his first scheme can be found in Anthony Alofsin's book.²

Architect: Frank Lloyd Wright (1867-1959).

Frank Lloyd Wright was born in Richland Center, Wisconsin, and as a boy, worked summers on his uncle's farm. There he acquired his profound love of nature and admiration of the flat lands of the

Midwestern prairie. Though he never attended architecture school, Wright apprenticed first with J. L. Silsbee and then worked for seven years in the Chicago office of Adler and Sullivan. In 1893, Wright established an independent practice in Oak Park, Illinois, and built the Winslow House, possibly the first so-called Prairie house; subsequently, he designed a series of houses characterized by low horizontal lines, low-pitched roofs, banded windows and overhanging eaves which, innovative and indigenously American, came to be referred to as Prairie style.

Wright's long and prolific career was primarily though not exclusively devoted to residential architecture. Until approximately 1917 his architecture was dominated by works done in the prairie style, during the time period of Wright's activity in Glencoe.

After 1909, during the years he was working on the housing development for Sherman Booth, Wright's career slowed considerably and his life changed immeasurably. In 1909, Wright departed for Europe to oversee the German publication of his work. Following this first of many trips, two very significant volumes were published: *Frank Lloyd Wright: Ausgefuehrte Bauten* and *Ausgefuehrte Bauten and Entwurfe von Frank Lloyd Wright*. At the same time he was enjoying professional recognition, Wright was undergoing great turmoil in his personal life. Having fallen in love with Mamah Borthwick Cheney, the wife of one of his clients, Wright closed his studio and took Mamah Cheney to Europe with him.

Upon Wright's return from Europe in the fall of 1910, he had only five or six small projects in his office. One, the New York City Exhibition Pavilion for the Universal Portland Cement Company, held in New York's old Madison Square Garden with a bench and vertical light standards similar to those flanking the Glencoe bridge, received favorable public reaction. But the most important work in the office was Wright's house for Sherman Booth, and he perceived that job as the commission that would salvage his shaky career.³

During the next several years Wright spent comparatively little time in Chicago. In 1911, he drew up plans for converting his Oak Park home into a rental apartment and his studio into living quarters for his family. At the same time he was building a home, "Taliesin," in Hillside, Wisconsin, for his new life with Mamah Cheney. Although he maintained an office at 605 Orchestra Hall in Chicago, once Taliesin was finished he staffed an office there. In 1912, Wright designed a playhouse for Avery Coonley and a few homes, but his largest commission, and one of his major non-domestic works, was for Midway Gardens, a vast pleasure palace occupying an entire Chicago city block. It was innovative in the use of concrete as a decorative material and considered one of Wright's most successful efforts at creating a unified work of art that integrated sculpture and architecture. Yet it

was not a commercial success, and the structure went into receivership in 1916 and was demolished in 1929. Tragedy also struck Wright personally. While he was in Chicago working on Midway Gardens in 1914, a crazed servant at Taliesin murdered Mamah Cheney and her children. Wright's other major commission during the teens was the Imperial Hotel in Tokyo. Begun in 1913, it took ten years to complete. When construction started, in 1916, Wright turned over his Chicago office to his son John Lloyd Wright and spent a good deal of time traveling between Taliesin and Japan.

Wright's design for Ravine Bluffs Development, during the early teens, are stylistically tied to his Prairie School work. After 1915, Wright's architecture continued to be characterized by the geometric abstraction of his prairie designs, but he absorbed the influence of primitive Mayan culture and several of his buildings of the mid- to late teens, including the A. D. German Warehouse in Richland Center, Wisconsin, the Imperial Hotel and the Aline Barnsdall (Hollyhock) House in Los Angeles, incorporated rich and complex ornamentation. His interest in concrete, evidenced in the Ravine Bluffs Development Bridge, continued. In the German Warehouse he utilized cast in place concrete for his ornament. The Barnsdall House was built of poured concrete.

Wright's work on the Ravine Bluffs Development Bridge was carried out during a time of transition in both his personal and professional life. The design for the bridge with its geometric horizontality, is clearly linked to his earlier Prairie School work. Yet his use of concrete marked the beginning of a new creative interest to be further explored during the twenties in the concrete block houses he built in California.

Development of The Ravine Bluffs Subdivision: The Ravine Bluffs Subdivision, a subdivision in section six (6), Township Forty-two (42) North, Range Thirteen (13) East of the Third (3rd) Principal Meridian in Cook County, Illinois, was developed on property owned by Elizabeth K. Booth, wife of Sherman M. Booth II. On August 4, 1914, the Ravine Bluffs Subdivision was approved and accepted unanimously by the Board of Trustees of the Village of Glencoe.⁴ The plat was filed in the office of the Cook County Recorder of Deeds on August 19, 1914, as Document #5479940.⁵

A proposal was made five months later for the Ravine Bluffs Resubdivision, a subdivision of lots 18, 19, 20 in Ravine Bluffs. A plat was presented to the Glencoe Board of Trustees, together with Ordinance #707,⁶ providing for the vacation of that part of Meadow Road lying south of the south line of lot seventeen (17) extended west in Ravine Bluffs. Both the resubdivision and the ordinance were approved and accepted by the Village Board on January 5, 1915.⁷ The plat was filed in the Recorder's Office of Cook County, Illinois, on February 8, 1915.⁸ Lots 4 & 5 in Ravine Bluffs were

further subdivided as the Sylvan Bluffs Subdivision on August 14, 1922.⁹ The information was filed at the office of the Cook County Recorder of Deeds on October 17, 1922.¹⁰

Entrance Features and Improvements at Ravine Bluffs Subdivision: Frank Lloyd Wright defined the boundaries of the Ravine Bluffs Development with three poured concrete entrance features, each consisting of a spherical planter, vertical electric lamps (no longer functional) and a bronze plaque reading "Ravine Bluffs." While these entrance sculptures have been attributed to Alfonzo Iannelli, they undoubtedly are the work of Wright himself and are similar to the planter Wright designed for the Ravine Bluffs railroad waiting station of 1911.¹¹ On November 2, 1915, Sherman Booth was granted permission by the Board of Trustees of the Village of Glencoe to erect two of these entrance features at Ravine Bluffs, at the intersection of Sylvan Road and Franklin Road, and at the west of the turnaround of Sylvan Road. Once erected, each entrance feature was to become public property.¹² There has been no documentation found for the third entrance feature at the intersection of Meadow Road and Franklin Road.

In February of that year, two ordinances providing for improvements in Ravine Bluffs Subdivision were approved by the Village Board. Ordinance #714 mandated the construction of standard concrete sidewalks along portions of Sylvan and Meadow Roads, while Ordinance #715 provided for "the laying of a water-main in the same Roads, same Subdivision, connecting with the present water-main in Franklin Road." These Ordinances were dated and approved by the Glencoe Board of Trustees on February 2, 1915.¹³

Sherman M. Booth II and the Ravine Bluffs Development: Wright's principal patron in Glencoe was his attorney and friend, Sherman Miller Booth, II. For years Wright and Booth maintained a close personal and professional relationship: Booth represented Wright legally on numerous occasions, and accompanied Wright on the train from Chicago to Taliesin after the tragic slayings on August 15, 1914, at Taliesin, of Wright's lover, Mamah Borthwick Cheney, her two young children (John, age 10, and Martha, age 11), and four others by the butler, Julian Carlton.

Born in Philadelphia in 1876, the son of Sherman Booth (1812-1904) and his third wife, Augusta Smith, Booth spent his childhood in Wisconsin, as did Wright. According to personal discussions with Betty Booth Rosenwald, Sherman Booth II's daughter, her grandfather was an ardent abolitionist and editor of a Milwaukee anti-slavery journal. In 1854, he aided and abetted a fugitive slave. For this action he was arrested and charged with violation of the federal Fugitive Slave Act; subsequently, he became the center of a six-year controversy between the state of Wisconsin and

federal authorities which ultimately reached the United States Supreme Court.¹⁴ Perhaps his father's trouble with the law stimulated Sherman Booth's desire to become a lawyer; in any case, he established his law practice in Chicago at 105 S. LaSalle Street.¹⁵

In 1907, Sherman Booth married Elizabeth Knox with whom he settled in Glencoe and had three children (Knox, in 1908, Sherman, in 1910, and Betty, in 1917). Born in Cedar Rapids, Iowa, in 1880, Mrs. Booth attended Coe College and taught English in Osage, Iowa, before her marriage. In her obituary she is described as "a former leader in the fight for women's suffrage in Illinois, [and] chairman of the legislative department of the Illinois Equal Suffrage Association in 1913."¹⁶ True to the profile of Wright's early patrons sketched by Leonard Eaton in his book on that subject, the Booths were white, middle-class, Anglo-Saxon Protestants, fiercely Republican, though associated with liberal causes, and monetarily self-made, with great confidence in their own taste and power to positively influence their world.¹⁷ Both Elizabeth and Sherman Booth were active in the Glencoe community. In 1918, she served on the Board of Education, and in 1912, he became one of five founding members of the Park District Board. His interest in the development of Glencoe parks, as well as his appointment to the Park District Board of Directors accounts for the many commissions Booth gave Frank Lloyd Wright between 1911 and 1912 for park ornaments and features (trellises, gateways, drinking fountains, etc.).

In April, 1911, Wright's Chicago office prepared drawings for a spectacular residence, known as Scheme #1, for Booth which, had it been built as planned, would have ranked with Wright's greatest domestic projects of all times. Wright firmly believed that the more interesting the site the more interesting the design. Taking full advantage of the magnificent natural beauty of the property which had heavily wooded deep ravines and was situated next to a golf course, Wright's plan called for a dramatic approach to the house via a concrete bridge crossing a ravine and extending the driveway to the mansion. Partially spanning the east ravine, the house anticipated his later dramatic siting of Fallingwater, the home he designed in 1935 for Edgar Kaufmann. Unfortunately, these preliminary designs were discarded as too costly.

On April 14, 1916, Sherman Booth applied for a building permit (#333) to construct a smaller residence and garage. The structure, to be built of frame and stucco with a gravel roof, at a cost not to exceed \$16,000, was to be 108 ft. across the front, 50 ft. deep, and 34 ft. high. H. A. Peters was cited as contractor; two years earlier, in May, 1914, Peters had been hired by the Glencoe Board of Education to build a school at the corner of Grove and Hazel Avenues.

This pared down house that was constructed linked an existing barn and gardener's cottage situated at right angles to one another with a new vertical four-story central block. The barn "wing" which retains its original 1912 Wright designed ventilator became the kitchen and dining room, and the cottage "wing" became the east study and bedroom area. The new portion of the house consisted primarily of a large living room, second floor bedrooms and balcony, third floor sleeping porch and roof garden, and fourth floor open tower over a stairwell. James A. Robertson, architect and grandson of Harry F. Robertson, maintains that his grandfather, in charge of Wright's Chicago office from 1911 to 1916, worked closely with Booth on the revision and construction of Wright's plan (Scheme #1). He writes, "It is doubtful if Wright took more than just a passing interest in this relatively small commission, since his interests lay more with the Imperial Hotel Project in Tokyo and the Aline Barnsdall work in California."¹⁸ According to Alofsin, Harry Robinson did not return to Wright's office as manager until October 29, 1912.¹⁹

In a handwritten letter dated December, 1979, preserved in the Glencoe Historical Society, Booth's son, Sherman M. Booth III, described the home at 265 Sylvan Road (Storrer, S. 187) in Glencoe built by Frank Lloyd Wright for his family.²⁰ He notes that while it was under construction the family lived in a Wright-designed bungalow (incorrectly referred to as a "honeymoon cottage") across the ravine to the east, later sold and relocated. "There was a swinging footbridge (like a suspension bridge) across this fairly deep ravine to the "farming" area west of this ravine.... There was no other access before the Sylvan Rd. bridge was built. My father had started out trying his hand as a "gentleman farmer" farming this area (later he subdivided the "farm" with several other Wright houses - Sylvan Rd. and Meadow Rd.)...I remember a summer evening party between the gardener's cottage and the north ravine with Japanese lanterns and movies on an outdoor screen . . ."²¹

Five Wright-designed houses became the core of the Ravine Bluffs Development, constructed in 1915 but certainly designed in 1911 or 1912, about the same time that Wright designed for Booth a Ravine Bluffs railroad waiting station for the North Shore Electric Railroad, 1911.²² Applications for building permits for the Ravine Bluffs subdivision dated October 28, 1915, survive for four houses: lot #10 (permit #279), lot #15 (permit #280), lot #17 (Permit #281), and lot #22 (permit #282). An application for a building permit for lot #16 was not found, although a fifth Wright-designed subdivision house was built there. All four building permits list Sherman Booth as owner and H. A. Peters and Company as contractor. Each house was to be built of stucco with roof composed of shingles and composition, at a total cost not to exceed \$7,500. All were to be two stories and have the following dimensions: 51 feet fronts, 36 feet deep, and 32 feet high.

Sherman Booth, known to have speculated in real estate, afforded Wright the opportunity to realize his lifelong interest in creating attractive, low cost housing.²³ All variations of the same plan, the Ravine Bluffs houses include the Charles R. Perry Residence, built for Booth's sister at 272 Sylvan Lane (Storrer, S. 188); the Lute F. Kissam House, 1023 Meadow Road (Storrer, S. 192); the William F. Ross House, 1027 Meadow Road (Storrer, S. 191); the William F. Kier House, 1031 Meadow Road (Storrer, S. 190); and the Hollis R. Root House, 1030 Meadow Road (Storrer, S. 189). The plans of these houses excluding their porches are almost identical to that of the \$5,000 Fireproof House published in the 1907 *Ladies Home Journal* previously mentioned.²⁴ They are also similar to some of the plans for the American Systems Ready-Cut standardized houses designed for the Richards Brothers in Milwaukee, and to the rental houses designed for Edward Waller in River Forest (1909).

Frank Lloyd Wright's Activity in Glencoe other than Ravine Bluffs: Frank Lloyd Wright was active in Glencoe between 1905 and 1916. During those years he built ten houses and designed three more, created the Ravine Bluffs Development marked by three concrete entrance features and a reinforced concrete bridge, conceived two railroad waiting stations of which at least one was built, sketched plans for a town hall and numerous park features and ornaments. He employed new ideas and materials, devising a plan for affordable housing and constructing a residence of poured concrete. Only Oak Park and Chicago boast larger collections than Glencoe of Frank Lloyd Wright houses.²⁵

Wright's first commission in Glencoe was for the William A. Glasner House, 1905 (Storrer, S. 109), intended as a summer home for an urban bicycle manufacturer and his wife. Dramatically perched on the brow of a deep wooded ravine, the house was featured in *House Beautiful* (1906) as "A House without a Servant," which, "with a low pitched, broad eaved roof, lying at ease amid its rural surroundings, [was] refreshingly different from the usual tall, straight city house."²⁶ That the house was intended to be occupied by "two people and no servants" undoubtedly appealed to Wright's lifelong interest in creating modern, efficient, twentieth-century structures. Constructed in rough sawed dark-stained board and batten, the house was to have had a freestanding octagonal teahouse, accessible by an arched wooded bridge spanning the ravine (unexecuted). In 1902, Wright had used a similar bridging arch over a small brook in the double cottage built for George Gerts (Storrer, S. 077) in Whitehall, Michigan.

Of the three houses Wright designed in Glencoe in 1906, only the Grace Fuller Residence (Storrer, S. 123) was built (demolished). The designs for this house and others in Glencoe of that year were published by Wright in what has come to be known as the Wasmuth portfolio of drawings.²⁷ The summer cottage for Elizabeth Stone²⁸ was intended to be a long low board and batten structure in the

woods with wide eaves crowning a ravine, much like the Glasner House and the George Madison Millard House, 1906 (Storrer, S. 126) in adjacent Highland Park. Composed of "Sleeping-rooms, living-room with balcony, and dining room, which may be opened like a porch, and each separated by small, open, flower-filled courts," Wright's conception embodies his principles of organic architecture and reflects his desire to incorporate nature into his designs. Wright's other unexecuted project was for Walter Gerts, for whom he had previously designed a summer cottage in Whitehall, Michigan, as he had for Walter's brother George. In his Berlin monograph, Wright described the Glencoe house: "A simple gabled residence in a garden behind a wall [with] the music room, on the bedroom floor, the main feature of the house."²⁹

Though Wright had designed and built numerous commercial and public structures of board-formed poured concrete, the crown jewel being Unity Temple in Oak Park, Illinois (1904), his first and only prairie house actually built in board-formed, poured concrete was the Edmund D. Brigham House in Glencoe (Storrer S. 184; incorrectly published as 1915).³⁰ Possibly designed as early as 1906 and constructed in 1908, the year Wright designed stables for the same client, the Brigham House follows a cruciform plan and has a two-story central block flanked by a porch on the south and porte-cochere to the north. It closely resembles other houses designed by Wright in that year, including, the Robert W. Evans House, 1908 (Storrer S. 140), originally stucco but resurfaced with stone veneer in Chicago, and the G. C. Stockman House, 1908 (Storrer S. 139) in Mason City, Iowa. Designed in 1907, the Stephen M. B. Hunt Residence I (Storrer S. 138), La Grange, Illinois, planned for concrete though built in wood and plaster, is very similar to the Brigham House in window detailing and in the design of the two-story central block. The floor plans of the latter two houses are basically that of the "Fireproof House for \$5,000."

The additional projects in Glencoe Booth commissioned from Wright, but which remained unexecuted, included the second railroad waiting station for the North Shore Electric Railroad, a town hall and the numerous park features and ornaments that were undoubtedly commissioned because Sherman Booth was a founding members of the Glencoe Park District Board.

Although Frank Lloyd Wright designed more buildings for Glencoe than in any community except for Oak Park and Chicago, he built several homes in Chicago's other North Shore towns. Almost all of them were built between 1900 and 1910, before the bridge was envisioned, and were designed in the Prairie Style. They were typically faced in white stucco and characterized by horizontal banding, broad overhangs and ribbons of windows. The earliest, most significant and influential of his North Shore homes is the Ward W. Willits House, 1902 (Storrer, S.54), located at 1445 Sheridan Road in Highland Park. Wright also designed the Mary M. W. Adams House, 1923 Lake Avenue, 1906,

(Storrer, S.108) and the George Madison Millard House, 1689 Lake Avenue, 1906, in Highland Park. The Millard House differs from the more typical Prairie house in being sheathed in dark wood board and battens. Wilmette, Kenilworth, and Evanston each has one Prairie School house designed by Wright. In Wilmette, the Frank J. Baker at 707 Lake Avenue, 1909, with its cruciform plan, is particularly well known (Storrer, S.151). Kenilworth's Hiram Baldwin House at 205 Essex, 1905, like the Baker House, typifies Wright's prairie style work (Storrer, S.107). In Evanston, Wright designed a home in 1905 at 2450 Harrison for Charles E. Brown (Storrer, S.110). It is a more rectangular box-like structure. The sole residence that differs considerably from this early work, is a Lake Forest home he designed in 1951 for Charles F. Glore (Storrer, S.341). Like modern homes of the time, it utilizes a considerable amount of glass. It is built of brick, cypress and salmon-colored concrete and has a prow like end. Wright's Prairie Style subdivision for Sherman Booth, with its unique bridge, resembles no other part of the North Shore.

Wright's personal and professional activities elsewhere during the Glencoe years have understandably overshadowed his substantial and extremely important contributions there. The Glasner and especially the Booth House Scheme #1 provided Wright an exciting opportunity to design for irregular, magnificent natural terrain so different from the typical flat lots he usually worked with, preparing him for the greater future challenge of Fallingwater. In addition, the Ravine Bluffs Development provided Wright the opportunity to build affordable housing based on a fairly standardized plan. For all of his devotion to concrete as a building material for residential architecture it appears that it was in Glencoe that Wright first actualized his long-standing ambition to build a poured concrete house.

Bridges and Bridging in the Work of Frank Lloyd Wright: During his career, Frank Lloyd Wright designed one other bridge that was actually constructed. It was a simple concrete structure, with low concrete slabs forming sidewalls, that serves as a driveway bridge leading to Edgar J. Kaufmann's house, Fallingwater, built in Mill Run, Pennsylvania, in 1935 (Storrer, S.230). Although he only designed two bridges, the bridging of open space was central to Wright's design philosophy where space flows and intersects, framed and penetrated by geometric elements.

Driveways were spanned in many of his houses where porte-cocheres were formed topped by broad extending roofs that then rest on end piers. Excellent typical examples include the B. Harley Bradley Residence in Kankakee, 1900, (Storrer, S.052), the Ward W. Willits Residence in Highland Park, 1901, (Storrer, S. 054), and the Harry S. Adams Residence in Oak Park, 1913, (Storrer, S. 179). An unusual variation on the typical porte cochere can be found in Wright's design for the Fred B. Jones

Residence in Delavan Lake, Wisconsin, 1900. It has an arched porte cochere with a walkway above it linking the main house to a three story tower (Storrer, S. 083).

Wright frequently also used broad roofs to span open porches. This can be seen in the Willits House. The F. B. Henderson Residence in Elmhurst, 1901, (Storrer, S. 057), and the George Barton House in Buffalo, New York, 1903, (Storrer, S. 103), have similar open porches with a rectangular void topped by a low horizontal roof supported by massive square piers.

Bridged openings are commonplace in Wright's work. The design for the Francisco Terrace Apartments in Chicago (demolished), 1895, had an arched opening, with apartments above, connecting the street to an interior courtyard (Storrer, S. 030). His Hillside Home School II in Spring Green, Wisconsin, 1902, has a gallery bridging the driveway (Storrer, S. 069). And the Avery Coonley Residence in Riverside, 1907, has a rectangular opening forming a driveway under the guest wing (Storrer, S. 135). Wright continued to incorporate bridges into his later work in the concrete houses he designed in California. The Aline Barnsdall House in Los Angeles, 1917-20, has a bridge connecting the side wings of the house spanning the pool (Storrer, S. 208-11). The residence Wright designed for George M. Millard in Pasadena, 1923, has a bridge connecting the house and the roof terrace over the garage (Storrer, S. 214).

Two Wright buildings were specifically designed to bridge waterways. The Lake Mendota Municipal Boathouse Wright built in Madison, Wisconsin, 1893, (dismantled), had a bridge over the waterway linking the lake and the area for berthing boats (Storrer, S. 022). In his design for the George Gerts Double House in Whitehall, Michigan, 1902, Wright incorporated a bridge to span a winding brook (Storrer, S. 077).

Bridging was a significant integral part of numerous Wright designs, and Wright's Ravine Bluffs Development Bridge serves as an example of one of the many instances where he used bridges to span various kinds of space. Yet it is also unique in Wright's work. Unlike the simpler bridge built much later to reach Fallingwater, the Ravine Bluffs Bridge reflects the Wright Prairie Style philosophy. It is complex in its spatial organization, integrating geometric shapes and complementing Wright's designs for the Sherman Booth Residence, the other prairie houses in the subdivision, and the geometric entrance features.

Concrete in the Work of Frank Lloyd Wright: Frank Lloyd Wright's use of concrete for the Ravine Bluffs Development Bridge reflects his belief in the suitability of this material for modern architecture, that is, structures built in the machine age. Although board-formed reinforced concrete

had been used for domestic architecture rather extensively in Britain in the nineteenth century, Wright pioneered its use for residential buildings in America. Earlier, Wright had produced numerous designs for non-residential buildings and objects including a project for a monolithic Concrete Bank (1894), a cement vase in cast concrete (1903), and a lamppost in cast concrete for Robert M. Lamp (1904). In 1901, Wright designed the Exhibition Pavilion at the Pan American Exposition in Buffalo (Storrer, S. 063) for the Universal Portland Cement Company (demolished), and in 1910, a second exhibition structure (Storrer, S. 163) for the same company at Madison Square Garden. Another study for a cast "concrete bank building in a small city" exists from 1901 and was considered by Wright significant enough for inclusion in the Wasmuth portfolio.³¹

In 1905, Wright produced ambitious designs for two reinforced concrete buildings in Chicago: a concrete apartment building (unbuilt) for Warren McArthur,³² and the E-Z Polish Factory for William E. and Darwin D. Martin (Storrer S. 114). Unlike Unity Temple with its exposed concrete surface, Wright faced the E-Z Polish Factory with buff-colored brick but added no further decorative features. Certain elements of the facade are similar to those of the Larkin Company Administration Building, Wright's most famous early Buffalo office building, 1903 (demolished, 1949-50; Storrer, S. 93). In 1906, Wright designed an unexecuted cast-concrete home and workshop for Richard Bock, his friend and colleague at the Oak Park studio.³³

Wright's fascination with concrete is reflected in an article he published in April 1907 in the *Ladies Home Journal* entitled "A Fireproof House for \$5,000," in which he extolled the virtues of concrete construction for residential architecture:

A structure of this type is more enduring than if carved intact from solid stone, for it is not only a masonry monolith but interlaced with steel fibers as well. Insulated with an impervious non-conducting inner coating it is damp-proof; it is, too, warmer than a wooden house in winter and cooler in summer...[altogether] an improvement over the usual cut-up, overtrimmed boxes doing duty in this class, wherein architecture is a matter of 'millwork' and the 'features' are apt to peel.³⁴

That he believed his design for an affordable, concrete house worthy of international announcement is attested by his inclusion of it in the Wasmuth portfolio. There Wright describes it as "A simple house, four sides alike, for sake of simplicity in making forms, with entry added at side, and trellised terrace [with] an insertion of square colored tiles ...just beneath the soffit of the eaves, certain ones opening for circulation of air in summer."³⁵

Of concrete Wright later wrote:

Aesthetically concrete has neither song nor any story. Nor is it easy to see in this conglomerate, this mud pie, a high aesthetic property, because in itself it is amalgam, aggregate compound. And cement, the binding medium, is characterless. [Yet] I had finally found simple mechanical means to produce a complete building that looks the way the machine made it, as much at least as any fabric need look. Tough, light, but not "thin"; imperishable; plastic; no unnecessary lie about it anywhere and yet machine-made, mechanically perfect. Standardization as the soul of the machine here for the first time may be seen in the hand of the architect, put squarely up to imagination, the limitations of imaginations the only limitation of building.³⁶

As previously mentioned, though Wright had designed and built numerous commercial and public structures of board-formed poured concrete prior to his work in Glencoe, it was here that his first board-formed, poured concrete house, the Edmund D. Brigham Residence, was constructed. The houses designed for the Ravine Bluffs Development, though constructed in stucco were designed to be built of concrete; all are variations of the same plan which, without their porches, are almost identical to the plan for the \$5,000 Fireproof House of 1907. The three poured concrete entrance features defining the boundaries of Ravine Bluffs handsomely complement the concrete bridge which with its large planting urns, built in trapezoidal bench, and street lamps, is itself sculptural.

Frank Lloyd Wright's Design for the Ravine Bluffs Development Bridge in the Context of the History of Bridge Design: Although typically bridges have been constructed by builders and engineers not by architects, and Frank Lloyd Wright designed few bridges to span rivers and ravines, the bridge has been of primary significance in the history of civilization. Bridge construction allowed humanity to overcome barriers to settlement, transportation and trade.

Human ingenuity allowed for a number of different structural systems to carry railways, road vehicles and man on foot over rivers, gorges, canals and creeks. Large and small, bridges have taken many forms. One of the first types of permanent bridges to be built in America, in the late 18th Century, was the stone bridge. Most were constructed using materials gathered or quarried near the site of the bridge. Stone bridge building was very labor intensive so tended not to be used for very large structures; they tended to be gracefully arched structures, relatively small in scale and built by local stone masons. Because America had an abundant supply of forests, wood was readily available almost everywhere and was frequently used for both temporary and permanent bridge structures. The most pervasive type was the simple truss bridge where small members were joined together in a

series of triangles that interconnected to form the bridge; many were covered to prevent the wood structure from deterioration. Truss bridge technology was easily convertible to metal components, and in the 19th Century metal truss bridge building was ubiquitous. The change from wood to metal trusses was a gradual process that began in the 1840's with the Howe Truss bridge developed by William Howe in Massachusetts. Some truss bridges were a combination of metal and wood; some were all metal. Metal truss bridges were built throughout the 19th Century, developed in a wide range of types to be built of cast iron, wrought iron, and later, steel. Although most iron and steel bridges built in the United States in the 19th and early 20th centuries incorporated some variety of truss design, in some instances metal arch bridges were built. Metal was also used in the construction of suspension bridges. Some of the longest and most famous bridges in the United States, such as the Brooklyn Bridge (1883) and the Golden Gate Bridge (1937), consist of a deck supported by iron or steel cables that run across two tall support towers built of stone or concrete. John A. Roebling, who designed the Brooklyn Bridge, set the standard for suspension bridge construction.

Late in the 19th century engineers began to develop designs using reinforced concrete, which combined concrete, that is strong in compression, with steel to provide tensile strength. Wright's Ravine Bluffs Development Bridge is of concrete with steel reinforcement bars in the decking. When reinforced concrete bridges were first built, in the late 1880's and 1890's they were similar in shape to stone arch bridges. The oldest reinforced-concrete bridge in the United States, the Alvord Lake Bridge in Golden Gate Park, built by Ernest Ransome in 1889, is a modestly-scaled arched bridge with a 20' span. It was meant to look architectural with such features as imitation stone surfaces and concrete stalactites that hang from the interior curve of the arch. In the early 1900's, Robert Maillart was designing innovative and beautiful reinforced concrete bridges in Europe. His 1905 Tavansa Bridge over the Rhine in Grisons, has an arched span of 51 meters, but more importantly integrated an arch and roadway into a single form creating a graceful structural unit.

Reinforced concrete bridges generally are arched. Some, like Wright's bridge in Glencoe, are deck arches, in which the roadway lies on top of the arches; others are rainbow arches in which the arch extends above the roadway. Deck arches were first popularized in America in the 1890's by Fritz von Emperger and Edwin Thatcher.³⁷ These deck arch bridges either had closed spandrels or, if spans were greater than about 100', open spandrels with a series of struts or supports connecting the deck and arch. This reduction in the amount of concrete also reduced costs.

Reinforced concrete bridges became popular for several reasons. Closer in form to stone bridges and less technological looking than steel bridges, people tended to find them more visually appealing in picturesque natural settings. In addition, reinforced concrete bridges could be built more

economically. They utilized readily available materials -- sand and gravel, and cement; they could be built by relatively unskilled laborers and at least initially they reduced maintenance costs. Poured and reinforced concrete construction had for many years appealed to Frank Lloyd Wright. It was a malleable material that could be formed into Wright's desired geometric shapes to complement his designs for Sherman Booth's home and the other residences in the Ravine Bluffs Development.

The importance of Frank Lloyd Wright's Ravine Bluffs Development Bridge in the history of Illinois bridges was noted in a draft inventory of historic bridges in Illinois initiated by the Illinois Department of Transportation in the late 1980's. The survey is a topological analysis of 374 bridges located throughout the state with history on the various types. The report notes that the earliest reinforced concrete deck bridge known in Illinois is a 46' hybrid arched slab type built in 1906 west of Chicago; the builder of this bridge, embellished with bas-relief lions, is unknown. The survey lists many reinforced concrete bridges, noting that hundreds of reinforced concrete deck girder bridges with lengths between 45 and 55 feet were built in the 1920's from standard plans by the Division of Highways. Although most of the bridges noted in the report tend to be of a larger scale than Wright's bridge, its significance was described:

Nowhere was an early blend of horizontal lines and function more dramatic than in the bridge designed in 1915 by Frank Lloyd Wright. Built over a ravine in Glencoe near a home of his design, Wright's only bridge combined continuity in the deck with a supporting frame of slender members. Replaced in 1985, the new bridge is outwardly an exact replica of the original structure but internally incorporates state-of-the-art reinforcement techniques. The 1915 structure was on the National Register.³⁸

III. ARCHITECTURAL INFORMATION

Description: The Ravine Bluffs Development Bridge is a three-span reinforced concrete structure accommodating one lane of vehicular traffic and pedestrians, with clear spans of 12', 14' and 12'. Its overall length is 80' and its overall width is 30'8". On the north side, the bridge extends 70'2" from edge to edge of a 3'2" high, 1' wide abutment buttress wall containing light standards and shallow urns located at the east and west ends of the bridge. A six foot wide sidewalk runs the full length of the north side, and there is a ten foot wide built-in bench set in four feet from the sidewalk. The bench is 38'11" from the edge of the east wall and 16'3" from the edge of the west wall. On the south side, the bridge extends 74' from edge to edge of abutment buttress walls. This wall is three feet wide and ten feet long on the east end and twenty feet long on the west end. There is a 44' span that is

recessed 1'6" behind the buttress walls. Walls between the abutment buttress walls are one foot wide with an 8" cap border. There is also an 8" cap border on the mezzanine wall.

The concrete street deck is 1'4" thick and supported by two 3' piers that are 14' apart. The deck is made up of one-way concrete slabs and concrete joist construction. The concrete joist construction under the sidewalk may have been built after 1915. The concrete slab is 1'2" thick with two inches of asphalt on the concrete. The piers extend 15' down to the ravine bottom. They are spanned by a mezzanine level bridge that is 8'6" beneath the roadway. This lower bridge is 17' long by 12'8" wide on the inside and is 8" thick. Located beneath the mezzanine level bridge is a segmental arch that is approximately 8' from the top of the arch to the bottom of the ravine.

Each of the two abutment buttress walls on the north side of the bridge contain an urn and a light standard. The urns are 6' square and stand 20" tall. Recessed within the urn is a 4'11" square slab and a recessed circular planting bowl that is approximately 4' in diameter and 1' deep. The square slabs rest on a 1'2" pedestal and a 2' square base. The urns are located on the north end of the abutment buttress walls. The lighting standards are on the south end of the abutment buttress walls. They are composed of intersecting rectangles that extend from a base that is 1'x1'6" and 1' high to a total height of 6'7". The intersecting rectangles measure 1'x1'3". At the top is an opening that is approximately 1"x6" crossed by vertical slats and topped by two projecting horizontal bands and the 6"x7"x1'4" high rectangular light fixture with a frosted glass opening. Urns with a circular planting bowl topped by a square rim and resting on a narrow pedestal and wide base, such as those found on the bridge, are a typical Wright feature. They are typically symmetrically placed, resting on low parapet walls or piers and found on corners or flanking openings. They may be seen at the Ward W. Willits House (Storrer, S. 054) in Highland Park, Illinois, (1902), at the Susan Lawrence Dana House (Storrer, S. 072) in Springfield, Illinois, (1902), the Darwin Martin House (Storrer, S. 100) in Buffalo, New York (1904), and at many of his other residential designs. Although Wright frequently incorporated specially-designed lighting into his designs, lighting standards such as those on the bridge are not as commonly found. Similar ones were used to flank a bench designed by Wright for the Universal Portland Cement Company at the New York City Exhibition of 1910 (demolished), and for Midway Gardens in Chicago in 1913 (demolished).

Modifications and Subsequent History of the Ravine Bluffs Bridge: On February 22, 1922, a report was made to the Glencoe Village Board of Trustees from the engineering firm of Windes and Marsh as to the condition of the Sylvan Road Ravine Bluffs Bridge. On the basis of it members of the Board unanimously voted "that this bridge be closed until such time as the necessary repairs were

made."³⁹ Seven years later Don E. Marsh, of Windes and Marsh, appeared before the Glencoe Board of Local Improvements and reported that their bridge engineer had inspected the bridge and found:

The bridge proper is apparently in excellent condition, but the walk along the north side is at the point of collapse. All of the reinforcement is exposed, and most of the tile between the joists is broken. The sidewalk was apparently poorly designed, the reinforcing bars were not properly spaced, and sufficient consideration was not given to their bonding or anchorage. The tile joist construction is rarely, if ever, used in a structure which may be subjected to excessive temperature changes, nor should this type of construction be used where there is the least possibility of moisture collecting and freezing, as in this case. We recommend that the present sidewalk be entirely removed, including the rail, and that the reinforcing bars which extend from the bridge be cleaned, and a seat cut for the new walk in the abutment, to receive the new walk beams and handrails...We believe the sidewalk should be carefully barricaded to allow no one to enter thereon until repairs are made, as it is now in a very precarious condition."⁴⁰

On November 14, 1929, Ordinance #1086 was adopted by the Glencoe Village Board. It followed the recommendation of the Board of Local Improvements and provided for "the construction of a local improvement consisting of the removal of the existing concrete sidewalk and handrail, and constructing new concrete sidewalk and handrail to replace said existing handrail and sidewalk of the bridge in Sylvan Road; including cutting away existing concrete in the existing abutments, piers, and road-slab, uncovering, cleaning, straightening and bending existing reinforcing bars, which extend into the existing road-slab, constructing said sidewalk and said handrail with new reinforcing bars..." A contract in the sum of \$1,578 for the improvement (known as County Court No. 276) was awarded to Chas. Burkitt and Company, 746 Elm Street, Winnetka, Illinois, by the Board of Local Improvements on September 25, 1930.

Following these improvements and prior to 1977, the Sylvan Road Bridge seems to have been considered safe and in a fair state of preservation. On June 3 of that year, however, Robert H. Goodin, Glencoe's Director of Public Works, wrote to residents living near the bridge and informed them that weeks before a piece of the bridge deck fell into the ravine, and as a result, the Village closed the bridge to all vehicular traffic. He noted that at its May 12 meeting the Board authorized retaining the engineering firm of Hansen, Schneeman and Associates to survey the bridge and make recommendations for its rehabilitation. After their preliminary survey the bridge was reopened for passenger car traffic, but it was decided not to reopen the adjoining sidewalk. Days later, on June 9, Goodin again wrote to area residents and informed them that "the bridge had deteriorated

considerably more than it had appeared initially." Vehicular as well as pedestrian traffic was once again prohibited. On June 14, the consulting engineers of Hansen, Schneeman & Associates made their report to the Village of Glencoe indicating that "the bridge had deteriorated considerably and that two alternatives for restoration would be repair costs of approximately \$60,000 or replacement costs of about \$100,000." Prophetically, he added, "It appears unlikely that the bridge will be open soon." (Letter of June 17, 1977, from R. H. Goodin to residents living near the Sylvan Road Bridge.)⁴¹

In August, 1977, in order to qualify for federal historic preservation funds to restore the bridge, the Village of Glencoe applied to the Illinois Historic Sites Advisory Council for nomination to the National Register. At its December 16-17 meeting in Chicago, the Council recommended to the Director of the Illinois Department of Conservation that the Sylvan Road Bridge be nominated to the National Register of Historic Places. The bridge was listed on the National Register on June 23, 1978.

On April 6, 1978, R. B. Morris, Village Manager of Glencoe, wrote to Glencoe residents living in the Sylvan Road Bridge area and informed them:

As you know, the Village is seeking Federal-State funding for this bridge renovation project. It appears that, if the Village is successful in obtaining these outside funds (estimated at \$43,000), the Village will still be required to pay about \$28,000. Board members have expressed the hope that the residents of the Sylvan bridge area may wish to contribute to the cost of this bridge project - to reduce the cost to the Village. One of the matters to be discussed on April 13, therefore, will be the question of Village financing and financial contributions from area residents.⁴²

By June, 1978, it was determined that the State of Illinois would finance 70% of the repair costs with Federal Highway funds. The Glencoe Village Board of Trustees agreed to budget \$14,050 for restoration of the bridge provided that residents and others agree to match that amount. A neighborhood fundraising drive was organized, and by September 21, 1978, in a letter to Village residents living near the Sylvan Road Bridge, Village Manager R. B. Morris reported:

Members of the Ravine Bluffs Association and others have formed a steering committee for a Village-wide fund raising drive that is now under way. By today, 192 contributions totaling \$10,975 have been received at the Village Hall. Steering committee members and Village officials are most heartened by the interest shown by Glencoe residents in this bridge restoration project. At their September 14 meeting, Village Board members voted to

authorize our consulting engineer to begin the necessary engineering and plan preparation work with the intent that the plans will be forwarded to the State of Illinois so that the restoration work can begin next spring.⁴³

In the October, 1978, issue of *The Glencoe Memo*, it was reported that more than \$14,700 had been collected and that initial engineering studies and preparation of plans and specifications were underway, with construction work scheduled to begin in the spring of 1979. Work on the project did not proceed as planned, however, because the original Federal-State funding program was discontinued.

On February 12, 1981, the Village of Glencoe approved an agreement with Hampton, Lenzini and Renwick, Inc., Civil Engineers and Land Surveyors, Elgin, Illinois. Under its contract, the firm prepared a detailed physical inventory with photographs, a preliminary study of geotechnical conditions and a combined corridor and design location report. This fact-finding mission and environmental impact study along with subsequent test results indicated that a complete replacement of the structure with a properly designed replica was in order.

In a letter dated September 21, 1981, to Ravine Bluffs Association members, an organization of neighbors in Ravine Bluffs, who had contributed to the Frank Lloyd Wright Bridge Fund, Village President Florence H. Boone reported:

That program had included a 70% Federal-State and 30% Village-Private contribution share but had not provided a Federal-State reimbursement for preliminary engineering. The new Federal-State funding program provides an 80% Federal-State and 20% Village-Private contribution share as well as an 80% reimbursement for all engineering work.⁴⁴

A second phase of the contract between the Village and Hampton, Lenzini and Renwick, Inc., was approved on March 10, 1983. Final detailed field surveys, geotechnical studies and field plans, specifications and estimates ready for the taking of construction bids were prepared.

After being closed to traffic for seven years, Carl Peter, Public Works Director of Glencoe, announced, "Because of erosion caused by the weather, the bridge can't be reconstructed but a replica would be built," and that none of its elements could be used in the reconstruction ("Sylvan Rd bridge work put on hold," *Glencoe News*, February 16, 1984). On October 11, 1984, a contract was let for the construction of a structure and appurtenances. On November 15, 1984, Peter wrote to area residents informing them:

The Illinois Department of Transportation has awarded a contract in the amount of \$328,437.20 to the Eric Bolander Construction Company of Libertyville, for the replacement of the Sylvan Road-Frank Lloyd Wright bridge . . . The engineering inspection will be handled by . . . the Village's consultant of Hampton, Lenzini & Renwick . . . Actual removal of the existing structure should begin on November 19. The contractor intends to remove the existing structure this year, and to do as much new concrete work as the weather permits. The entire structure is expected to be completed next June, with all electrical, storm sewer, paving, and landscape work done by early August.⁴⁵

Prime consultant for the construction was to remain Hampton, Lenzini and Renwick. The quality control subconsultant was to be Claude H. Hurley, Company, of Oakbrook Terrace, Illinois, and the structural advisor was to be Willett, Hofmann & Associates, Inc., of Dixon, Illinois.

The reconstruction of the Ravine Bluffs Development Bridge which was anticipated in the November 15, 1984, letter did actually happen. The bridge was completely demolished and removed, and a new bridge was constructed that replicated the appearance of the original Frank Lloyd Wright bridge.

On Sunday, October 27, 1985, a ceremony dedicating the reconstructed Sylvan Road Bridge was attended by approximately 100 people. The rebuilding of the Frank Lloyd Wright bridge won the outstanding local Public Works project of the year 1985 for the suburban branch of the American Public Works Association, Chicago Metropolitan Chapter. Because the original bridge was demolished and not rehabilitated using the original historic materials, however, the Ravine Bluffs Development Bridge was removed from the National Register of Historic Places.

IV. SOURCES OF INFORMATION

Endnotes:

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2. Anthony Aloffson, *Frank Lloyd Wright: The Lost Years, 1910-1922, A Study of Influence* (Chicago: The University of Chicago Press, 1993), 69.

3. *Ibid.*, 68.
4. *Journal*, 175.
5. *Plat Book 130* (Chicago: Cook County Recorder of Deeds), 46-47.
6. *Ordinances*, Ordinance 707 (Glencoe, IL: Village of Glencoe, July 7, 1914-Dec. 7, 1915), 1-2.
7. *Journal*, 193.
8. *Plat Book 138*, 1.
9. *Journal of the Board of Trustees*, Sept. 12, 1921-June 15, 1925, (Glencoe, IL: Village of Glencoe, August 14, 1922), 78-87.
10. *Plat Book 173*, 47.
11. Susan Solway, "Frank Lloyd Wright and Glencoe," *Wright Angles*, Vol. XIX, No. 3 (Fall 1993), 6.
12. *Journal*, 1915, 261
13. *Ibid.*, 199.
14. Personal interviews of Betty Booth Rosenwald, Sherman Booth's granddaughter, with Susan Solway, March-October, 1993.
15. *Bumstead's Evanston City and North Shore Directory, Evanston 1917-1918*, (Chicago, IL: Bumstead & Company, 1917-1918), 1003.
16. "Elizabeth Knox Booth," *The Winnetka Talk* (September 8, 1960), 105.
17. Leonard K. Eaton, *Frank Lloyd Wright and Howard Van Doren Shaw: Two Chicago Architects and their Clients* (Cambridge, Massachusetts: MIT Press, 1969), 36.

18. Robinson, James A. *The Life and Work of Harry Franklin Robinson*. (Hong Kong BCC: Hilross Development, 1989), p. 104.

19. Alofsin, 309.

20. William Allin Storrer, in 1993, published a work-by-work guide to more than 470 buildings designed by Frank Lloyd Wright. It is the stated purpose of Storrer's book to identify each and every built structure designed by Wright or under his direction while, through textual comment, photographs and plans, placing his work in a context to enrich the reader's understanding. Each work is given a Storrer catalogue number unique to the building. The buildings are in approximate chronological order. Throughout the text of the HAER documentation on the Ravine Bluffs Development Bridge, building designed by Wright are referred to by Storrer's catalogue number. For instance, the Sherman Booth Residence is given the number S. 187. William A. Storrer, *The Frank Lloyd Wright Companion* (Chicago: The University of Chicago Press, 1993).

21. Sherman Booth, III, December, 1979. Letter preserved in The Glencoe Historical Society, Glencoe, IL.

22. Solway, 5.

23. *Ibid.*

24. Frank Lloyd Wright, "A Fireproof House for \$5,000," *Ladies Home Journal*, (April, 1907): 24.

25. Solway, 3ff.

26. C. E. Percival, "A House Without a Servant," *House Beautiful*, Vol. XX, no. 3, (August 1906): 13.

27. Frank Lloyd Wright, *Ausgefuehrte Bauten und Entwurfe von Frank Lloyd Wright* (Berlin: Ernst Wasmuth, 1910), pl. XLb.

28. *Ibid.*, pl. L.

29. *Ibid.*, pl. LII.

30. Solway, 4.
31. Wright, *Ausgeführte Bauten*, pl. XIIa and B.
32. *Ibid.*, pl. LIV.
33. *Ibid.*, pl. LXII; Frank Lloyd Wright, "In the Cause of Architecture," *The Architectural Record* (March 1908): 23.
34. "Fireproof House," 24.
35. Wright, *Ausgeführte Bauten*, pl. XIVa and b.
36. Frank Lloyd Wright, "The Nature of Materials" in *Frank Lloyd Wright: Writings and Buildings*, ed. Edgar Kaufmann and Ben Raeburn (New York: A Meridian Book, New American Library, 1960), 225; quoted in Solway, 4.
37. Donald C. Jackson, *Great American Bridges and Dams* (Washington: The Preservation Press, National Trust for Historic Preservation, 1988), 36.
38. "Determination of Eligibility, Historic Bridges of Illinois," Illinois Department of Transportation, 2300 South Dirksen Parkway, Springfield, Illinois, 1989.
39. *Journal of the Board of Trustees*, September 12, 1921-June 15, 1925, (Glencoe, IL: Village of Glencoe, February, 27, 1922), 35.
40. *Journal of the Board of Local Improvements, to November 9, 1939*, (Glencoe, IL: Village of Glencoe, July 11, 1929), 92.
41. Letter preserved in the Glencoe Historical Society, Glencoe, IL.
42. *Ibid.*
43. *Ibid.*
44. *Ibid.*

45. *Ibid.*

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